

REMARKS

Claims 1-16 are all the claims pending in the application.

Initially, it is noted again that Applicants have not claimed priority under 35 U.S.C. § 119, as this application is a National Stage Entry which does not claim priority from an earlier foreign application.

I. Rejection of Claims 1-3 under 35 U.S.C. § 112, first paragraph

On page 2 of the Office Action, the Examiner rejects claims 1-3 under 35 U.S.C. § 112, first paragraph, because the best mode contemplated by the inventor has not been disclosed.

Specifically, the Examiner asserts that evidence of concealment of the best mode is based upon Applicants claiming a powder of hydrogen desorbed metal hydride because a hydrogen desorbed metal hydride would be merely a metal and not metal hydride as claimed.

Applicants respectfully submit that the best mode has not been concealed.

As described at page 6, lines 1-12 (and claimed in, e.g., claims 4 and 7), heating treatment is conducted after compression molding to desorb hydrogen from the metal hydride. Therefore, the specification discloses that hydrogen in the metal hydride is desorbed to manufacture the electrode of the present invention. In addition, Fig. 1, as described at page 10, lines 20-25, shows the compressed powder of metal carbide and metal hydride (Fig. 1a) prior to heat treatment, and compressed powder of metal carbide and metal (Fig. 1b) after heat treatment, i.e., after the hydrogen is desorbed from the metal hydride. As a result, the electrode of the present invention has moderate strength and crumbliness as well as safety. See page 12, line 22 to page 13, line 7.

Thus, contrary to the Examiner's assertion, there is no evidence that Applicants concealed that the electrode of the present invention contains metal (or a metal hydride desorbed of hydrogen).

Accordingly, withdrawal of the foregoing rejection is respectfully requested.

II. Rejection of Claims 1-16 under 35 U.S.C. § 103(a)

On pages 2-5 of the Office Action, the Examiner maintains the rejection of claims 1-16 under 35 U.S.C. § 103(a) as being unpatentable over Saito et al. (U.S. Patent 5,858,479).

Basically, the Examiner takes the same position as in the previous Office Action. In addition, on pages 5-6 of the Office Action, the Examiner asserts that Applicants' arguments are not persuasive.

Applicants respectfully traverse the rejection and submit that Saito does not teach or suggest the electrode of the present invention, and thus, does not render the present invention obvious.

The present invention is directed to an electrode for electric discharge surface treatment comprising a compressed mixture of at least a powder of metal carbide and a powder of hydrogen desorbed metal hydride (claim 1 and 7). The present invention is also directed to a method of making the electrode of the present invention (claim 4). In addition, the present invention is directed to a method of discharge surface treating using the electrode of the present invention (claim 10).

First, the Examiner asserts that Applicants merely claim desorbing hydrogen. However, claim 1 recites "a powder of hydrogen desorbed metal hydride". Thus, Applicants do not merely claim desorbing hydrogen but that the hydrogen of the metal hydride has been

desorbed. Thus, the final form of the electrode having metal hydride where the hydrogen has been desorbed is claimed.

In addition, the disclosure of the present application indicates that hydrogen of the metal hydride is desorbed and that the metal remains in the electrode. *See* page 10, lines 20-25 of the present specification. That is, the hydrogen is desorbed such that a metal powder remains.

Next, the Examiner takes the position that Applicants do not claim the electrode in its "final" stage, and thus the Examiner interprets that the electrode can be at any stage during the manufacturing process. As noted above, claim 1 recites "an electrode for electric discharge surface treatment comprising a compressed mixture of at least a powder of metal carbide and a powder of hydrogen desorbed metal hydride". Thus, Applicants claim an electrode where hydrogen has been desorbed from the metal hydride, and the electrode is in the final stage.

Then, the Examiner asserts that Saito teaches desorbing hydrogen because Saito teaches the complete separation of titanium and hydrogen, that only titanium is added in the final form of the electrode, and that hydrogen is merely used as a cleaning particle and is removed.

As argued in the previous response, Saito does not disclose desorption of hydrogen prior to use or during manufacture of the electrode. Saito relates to an electrode for electric discharge surface treatment containing TiH_2 in its final form. *See* col. 5, lines 11-16 and Example 1 at col. 6. Specifically, Saito refers to the electrode, for example, as a " TiH_2 green compact electrode for electric discharge machining." *See* col. 5, line 11. Therefore, contrary to the Examiner's position, titanium is not the only material in the final form of the electrode of

Saito. In addition, Saito discloses that the hydrogen of TiH_2 begins to separate at a temperature of $300^{\circ}C$ or more while the TiH_2 green compact is in the process of being used as a machining electrode, and that the nascent hydrogen strikes the workpiece surface and removes or cleans an oxide film or the like which exists on the workpiece surface. *See* col. 5, lines 37-51. Therefore, titanium hydride is maintained in the final electrode in order to obtain a cleaning effect when the hydrogen dissociates during electrical discharge. Saito further discloses that a surface of the workpiece is initially cleaned by the hydrogen at nascent state, then the TiH_2 powders are deposited on the clean workpiece metal surface. *See* col. 5, lines 65-66. This disclosure further indicates that the final product of Saito contains TiH_2 and that the hydrogen is not desorbed prior to use.

In contrast, in the present invention, hydrogen is desorbed from the metal hydride before use as a result of a heat treatment. *See* Section II above. Accordingly, the electrode of the present invention differs in chemical form from the electrode of Saito.

The difference in chemical form of the electrode of Saito and the electrode of the present invention is even more explicit when considering the claims drawn to the manufacturing process, in which desorbing hydrogen in the metal hydride is a claimed step.

In view of the above, it is respectfully submitted that Saito does not teach or suggest the present invention. Accordingly, withdrawal of the foregoing rejection is respectfully requested.

III. Conclusion

In conclusion, reconsideration and withdrawal of the §112 and §103(a) rejections is respectfully requested.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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